Forest Genetics Council of BC

Business Plan 2015 / 16

Budgets list only funds provided by the
provincial Land-Base Investment Strategy
Tree Improvement Program

Budgets approved
by the Forest Genetics Council of BC on
March 12, 2015

Compiled and edited by

Jack Woods

FGC Program Manager

Message from the FGC Co-Chairs

We are pleased to present the Forest Genetics Council of BC's (FGC) 15th consecutive annual business plan. This plan is based on input from FGC's advisory committees and was approved by the FGC . The budget in this plan balances expenditures across subprograms to optimally contribute to FGC strategic objectives and was accepted by the Provincial Chief Forester to guide Land Base Investment Strategy (LBIS) spending. Resources from SelectSeed Ltd., industry, the Canadian Forest Service, and universities also contribute to this plan and to the FGC's overall goals.

The LBIS allocation to forest genetics activities in 2015/16 is $2.5 million, unchanged from 2014/15. FGC-owned SelectSeed Ltd. contributes an additional amount of over $240,000 to FGC program management, meetings, publications, species-plan development, consulting, and associated research. Funds from SelectSeed Ltd. will also support a Research Scientist (tree breeder) position in Tree Improvement Branch of the Ministry of Forests Lands and Natural Resource Operations (MFLNRO).

This Business Plan sets out work contributing to the FGC's new Strategic Plan for the period 2015 to 2020. It outlines a balanced set of priorities and actions that contribute to enhancing the conservation, resilience, and value of BC's forest genetic resources. Activities and budgets are grouped into subprograms, including select-seed production, tree breeding, genecology, genetic conservation, cone and seed pest management, decision support, and extension. These activities also support MFLNRO Service Plan performance measures for timber production.

Work outlined here will continue to support tree breeding and seed orchard work that ultimately generates the genetic gains and seed needed for BC's highly progressive and collaborative reforestation programs. Some 175 million seedlings of the 250 million planted annually will be grown from seed produced in BC seed orchards. A new climate-based seed transfer system remains a top priority; it's implementation will apply the best available science to optimize the resilience and productivity of future planted forests. The complex work done by MFLNRO and university scientists is also supported and recognized in this Plan. These projects are key for maintaining healthy and productive forests and a strong forest sector.

We would like to thank all the people and organizations who contributed to this plan, and also those who contribute on a daily basis to the overall provincial forest genetics conservation and management program. We would also like to thank our stakeholders in both government and industry for their support.

Mark Tamas, RPF
FGC Co-chair
Tolko Ltd.

Brian Barber, RPF
FGC Co-chair
Ministry of Forests Lands and Natural Resource Operations

Table of Contents

1.0 Introduction **1**
1.1 Forest Genetics Council of BC 1
1.2 A Co-operative Effort 2
1.3 Land-Base Investment Strategy Tree Improvement Program 2

2.0 Process for Business Plan Development **3**
2.1 The Role of Council and its TACs 3

3.0 Subprogram Planning and Management **5**
3.1 Genetic Conservation Subprogram 5
3.2 Tree Breeding Subprogram 6
3.3 Operational Tree Improvement Program (OTIP) 8
3.4 Expansion of Orchard Seed Supply Subprogram (SelectSeed Co. Ltd.) 9
3.5 Extension and Communication 11
3.6 Decision Support Subprogram 11
3.7 Cone and Seed Pest Management Subprogram 12
3.8 Genecology and Seed Transfer Subprogram 13
3.9 Applied Tree Improvement and Biotechnology 14
3.10 Administration 15
3.11 Budget Summary 16

4.0 Funding and Administrative Mechanisms **17**
4.1 Funding Agreements 17
4.2 Monitoring and Reporting 18

Appendix 1: Seed Planning Units and Categories **19**

Appendix 2: Forest Genetics Council and Technical Advisory Committee Members **20**

Appendix 3: Species Plans **22**

List of Figures

Figure 1 Relationship between the FGC Strategic Plan, Land Base Investment Strategy Tree Improvement Program, and business plan development through FGC subprograms. 3

Figure 2 Link between FGC objectives, planning processes, and the subprograms of the FGC Business Plan. 4

Figure 3 Organizational relationships among SelectSeed, Land Base Investment Strategy, Forest Genetics Council, and the B.C. Forest Genetics Society 9

Figure 4 Administrative mechanisms for the delivery of the LBIS Tree Improvement Program funding. 17

List of Tables

Table 1 Conservation subprogram budget for 2015/16. 6

Table 2 Breeding subprogram budget for 2015/16 by species and by coast / interior. 7

Table 3 Operational Tree Improvement Subprogram (OTIP) budget requested and approved for the coast and interior areas. 8

Table 4 SelectSeed Company Ltd. 2015/16 forecast income and expenses by category. 10

Table 5 Decision Support projects and budget for 2015/16. 11

Table 6 Cone and Seed Pest Management Subprogram projects for 2015/16. 12

Table 7 Genecology and Seed Transfer Subprogram projects led by non-MFLNRO proponents and approved through a call for proposals. 13

Table 8 MFLNRO Tree Improvement Branch Genecology and Seed Transfer Subprogram project funding and priority activities by species for 2015/16. 14

Table 9 2015/16 budget summary for LBIS Tree Improvement Program contributions to subprograms. 16

Table 10 List of reports, responsibilities, distribution, and preparation dates for LBIS-supported projects. 18

1.0 Introduction

This section overviews the relationship between the multi-stakeholder Forest Genetics Council and its co-operators in the planning and implementation of forest genetic resource management activities in British Columbia, and for the management and allocation of funds under the Land Base Investment Strategy (LBIS) Tree Improvement Program.

1.1 Forest Genetics Council of BC

The Forest Genetics Council of BC (FGC) is a multi-stakeholder group representing the forest industry, Ministry of Forests Lands and Natural Resource Operations (MFLNRO), universities and the Canadian Forest Service. Council's mandate is to lead a provincial forest genetic resource management (GRM) and tree improvement program that encompasses the conservation, controlled use, and value-enhancement of the genetic resources of forest tree species, and to advise the Provincial Chief Forester on forest genetic resource management policies and budgets.

The FGC reports to the Provincial Chief Forester, and provides a forum for stakeholder representatives to set objectives and to oversee the development and delivery of a cooperative Business Plan to fulfill these objectives. The vision statement and objectives set out in the FGC Strategic Plan for the period 2015 to 2020, are:

Vision statement:

BC's forest genetic resources are diverse, resilient, and managed to provide multiple values for the benefit of present and future generations.

Objectives and performance measures:

1. The genetic diversity of all indigenous tree species is adequately maintained to support their continued evolution while providing environmental services and social and economic values.
2. Trees are well adapted to the climate of areas in which they are planted, contain adequate genetic diversity, and form part of diverse forest ecosystems across the landscape.
3. Sufficient seed of high genetic value is produced in provincial seed orchards to meet select-seed-use objectives of 75 percent of the provincial total sown by 2020.
4. Provincial tree breeding and orchard programs provide selected trees with sufficient genetic gain and diversity to improve the average volume-growth potential of select seed used for Crown land reforestation to 20% by the year 2020.
5. Provincial tree breeding and orchard programs provide sufficient seed with genetically-based pest resistance to address forest health issues and to supply 50% of seed sown provincially by 2035.
6. Secure resources and coordinate stakeholder activities to efficiently meet Business Plan priorities.
7. Monitor and report progress for genetic resource management activities.

This Business Plan defines the annual set of activities and budgets needed to achieve these objectives.

1.2 A Co-operative Effort

Forest genetic resource management in BC is a co-operative effort. The MFLNRO leads tree breeding activities, while both private industry and the MFLNRO manage seed orchards for the operational production of select seed. Genecology research is undertaken by the MFLNRO and universities in support of seed transfer policy, climate-change response, and genetic conservation. Industry provides logistical support for field trials and input on the development of priorities. Universities contribute through research in genetic conservation, genomics, climate modeling, and other aspects of GRM. Policy development for Crown lands is the responsibility of the MFLNRO, with advice provided to the Provincial Chief Forester through the FGC.

1.3 Land-Base Investment Strategy Tree Improvement Program

The Land-Base Investment Strategy (LBIS) encourages investments in the forest resource that maximize productivity and value while supporting forest resilience. The Tree Improvement Program supports specific implementation priorities related to timber supply, pest resistance, and adaptation to climate change.

FGC objectives align with MFLNRO and LBIS objectives for the enhancement of provincial timber supply and forest stewardship, and are set out in the FGC Strategic Plan for 2015 to 2020. The MFLNRO administers funding through the subprogram areas identified in the FGC Strategic and Business Plans (Figure 1).

Business planning carried out through the existing FGC-led process, includes Technical Advisory Committees (TACs) undertaking specific planning activities, developing budgets, and making operational recommendations (Figure 2). The FGC reviews and makes final recommendations for subprogram budgets and activities, and ensures the overall program meets MFLNRO and LBIS objectives and administrative requirements. The program is coordinated by the FGC Program Manager on behalf of the FGC, with substantial input from FGC Co-Chairs, Technical Advisory Committee (TAC) Chairs, and others.

In addition to LBIS Tree Improvement Program investments and MFLNRO direct program investments through staff and in-kind support, private companies also fund activities under Council's Business Plan. The species plans found in Appendix 3 outline general strategies, predict orchard seed production and gain, summarize conservation status, and provide key seed-use and availability statistics for individual species and seed-zone combinations known as seed planning units (SPU).

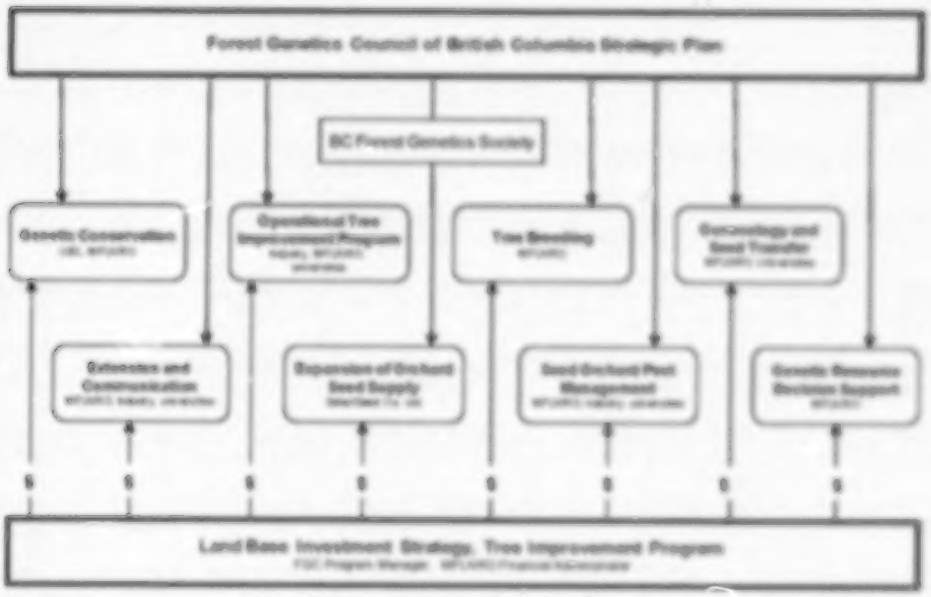
Forest Genetics Council of British Columbia Strategic Plan
BC Forest Genetics Society
Genetic Conservation
Operational Tree Improvement Programs
Tree Breeding
Extension and Communication
Expansion of Orchard Seed Supply
Seed Orchard Pest Management
Genetic Resource Decision Support
Land Base Investment Strategy, Tree Improvement Program

Figure 1 Relationship between the FGC Strategic Plan, Land Base Investment Strategy Tree Improvement Program, and business plan development through FGC subprograms.

2.0 Process for Business Plan Development

2.1 The Role of Council and its TACs

FGC members, representing the MFLNRO, forest companies, universities, the Canadian Forest Service, and small timber-tenure holders, provide strategic direction to the provincial forest genetic resource management program. FGC Technical Advisory Committees provide technical and policy information to Council and contribute to the development of FGC plans and associated budgets. The FGC Business Plan consolidates the subprogram plans and budgets into a comprehensive set of activities that address Council's objectives.

Council's seven TACs lay the groundwork for the FGC Business Plan:

- The Coastal and Interior TACs review and advise on Tree Breeding and Operational Tree Improvement Program (OTIP) subprograms, and provide input to species plans that guide work done by SelectSeed Company Ltd.
- The Genetic Conservation TAC (GCTAC) advises Council on issues related to genetic conservation, and identifies required activities and budgets under the Genetic Conservation Subprogram.
- The Seed Transfer TAC develops a strategy and activities for genecology research and climate-based seed transfer policy.
- The Extension TAC (ETAC) mandate is currently under review by the FGC. Extension remains a priority across all program areas.

- The Pest Management TAC (PMTAC) identifies information and research needs, and guides both research and extension activities for the control of insect and disease pests impacting seed orchards and seed production.
- The Genetic Resources Decision Support TAC (GRDS) oversees the development of activities and budgets that aid access to information for seed users and others who are managing, using, or assessing seed inventories and the genetic resource.

In addition, Council establishes other committees as needed to advise on shorter-term projects.

Program financial administration is led by the MFLNRO Tree Improvement Branch. Program management, including business plan and annual report compilation, is led by SelectSeed Company Ltd. (SelectSeed), on behalf of Council (see section 3.4 for more information on SelectSeed Ltd and its relationship to the FGC).

Council reviews all strategies, plans, or recommendations from its TACs and from SelectSeed for approval (or revision) before incorporating them into the FGC Business Plan. Figure 2 illustrates this hierarchical structure and the link between FGC objectives, planning processes, and the seven subprograms through which it is implemented. The process for defining activities and budgets for each subprogram is discussed in Section 3. Subprogram leaders are authorized to reallocate funds within their subprograms as necessary throughout the fiscal year, subject to limits and review process.

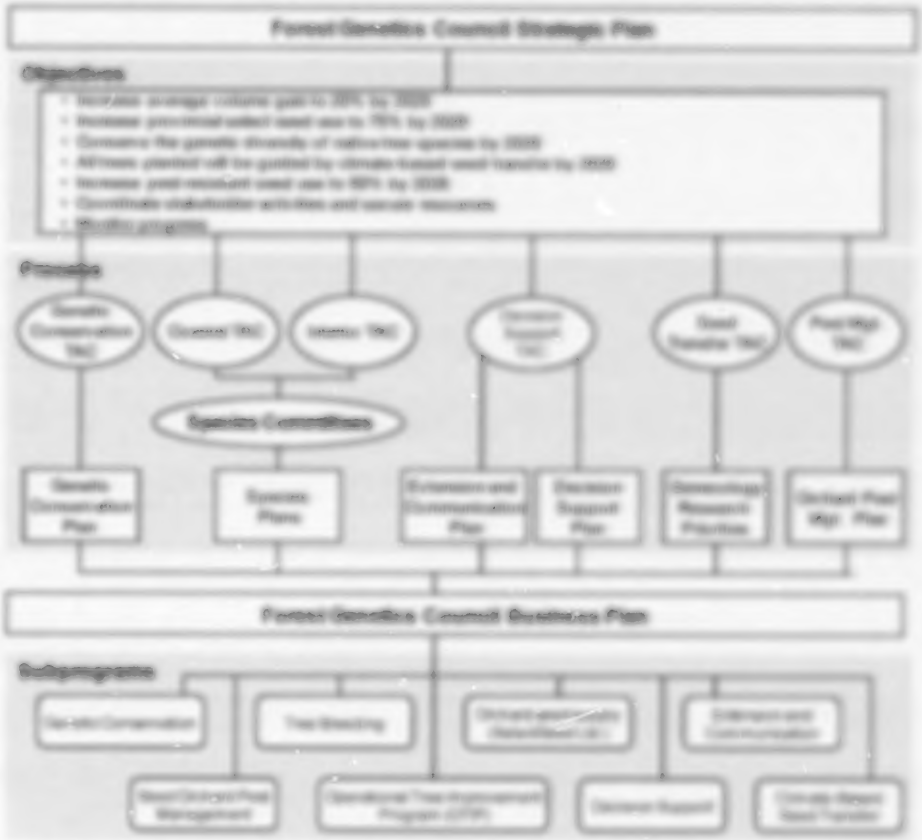

Figure 2 Link between FGC objectives, planning processes, and the subprograms of the FGC Business Plan.

3.0 Subprogram Planning and Management

3.1 Genetic Conservation Subprogram

Genetic conservation activities monitor and catalogue genetic resources for indigenous tree species, research conservation methods and needs, provide background genecology information for non-commercial species, and provide guidance to the FGC and the MFLNRO on policy development.

3.1.1 Planning

Genetic conservation activities are developed through the FGC Genetic Conservation TAC (GCTAC), with programs and spending approved by the FGC.

3.1.2 Management

Subprogram delivery is primarily shared by the Centre for Forest Conservation Genetics at the University of BC (CFCG), and the Tree Improvement Branch of the MFLNRO. The Provincial Tree Seed Centre (Tree Improvement Branch) maintains an ex situ seed inventory. The GCTAC sets broad objectives and provides budget recommendations to the FGC.

The CFCG receives funding from the MFLNRO under the LBS Tree Improvement Program. In addition, the Centre collaborates with other groups and agencies, and seeks funding from other sources as opportunities arise. Significant adjustments in technical objectives or budgets for projects receiving annual funding through the LBS must be approved by the GCTAC.

3.1.3 Activities and Budget

Investments through the CFCG allow the leveraging of funds with other provincial, national, and international agencies in the area of conservation genetics. The focus on climate modelling (ClimateBC and ClimateWNA) will continue in 2015/16, with collaborative funding from Genome Canada through the ConifTree project. This climate modelling work is a cornerstone for many forestry climate change projects being undertaken in BC and in some other jurisdictions. Other projects include updating climate change projections and species range maps for the Genetic Conservation Status Catalogue, assessing the adaptive diversity in seed orchard seed, and other ongoing projects. These projects are also leveraged through other funds and will be done by students associated with the CFCG.

In the 2015/16 fiscal year, the Centre will receive $187,500 for projects listed in Table 1. In addition, the Centre will continue to provide expertise on climate change impacts, seed transfer options, and ongoing planning and policy developments related to climate change.

A budget of $35,000 is allocated to the Forest Genetics section of the Tree Improvement Branch for field testing for whitebark pine blister rust resistance and for maintenance of a western pine ex situ conservation archive at the Cowichan Lake Research Station. Funding of $20,000 will be provided to the Kiltwistess Provincial Tree Seed Center for additional ex situ seed collections in 60 taxa in the existing conservation seed bank and for maintenance and testing of existing seed bank inventory. The Southern Interior Region of the MFLNRO will receive $17,470 for nursery inoculations on whitebark pine seedlings as part of a project to test and select for increased rust resistance in naturally occurring whitebark pine populations.

Table 1: [redacted]

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6.0 Tree Breeding Subprogram

The Tree Breeding Subprogram focuses on the continued development of parent trees selected for traits that will enhance timber supply, tree health, and stand resilience. Selected parent trees are used for the production of seed and vegetative material. Tree breeding activities include selecting parents to use, assess, propagation, field testing offspring, mating, establishing/maintaining/measuring trials, and support research. No research effort or funding is for the development of genetically modified trees. Breeding strategy and level of advancement vary among species and plant types. Out-of-it breeding programs are well into field testing and selection of either tree first, parents, or third-generations. The subprogram also includes seedset gain trials that quantify and breed gains in timber production, and

[redacted] is located in an upside-down delta terrain that impacts the performance of logistics plans in multiple, overlapping ways. The core of travelling salesperson is implemented by the Forest Advisory Services (FAS) [redacted] Crop Improvement Allocation.

[redacted] Planning

Prioritize the forwarding activities over rail passage and balancing while cargo value make subject to median tonnage, respectively. Import under Minister Manage, and Agricultural considerations such as case's count of specialising forwarding are, and is enhanced automation. Modelling, performance, and operations research investigate developing, [redacted] crop simulation cases considered by FAS' interest, such a power. Also, and demonstrate was given to ensure alignments with FAS' manage, objectives and with ongoing operational needs and programs.

Crop forwarding transportation budgets were developed by the FAS Council by the [redacted] Accounts' responsibility and reviewed by FAS' committees. These budgets were then adjusted by the Manager – Forest Operations, [redacted] Crop Improvement Division to take differences used to reach the most supported transportation budget allocations.

[redacted] Management

The [redacted] manages Crop forwarding transportation activities, with programs responsible to cooperations throughout the FAS. The Manager – of Forest Operations, [redacted] Crop Improvement Division, has overlooks the project to differentiate to support of FAS' objectives, implemented to allocations necessary and forwarding units or Crop forwarding activities to reminiscent support activities require the appointment of the Director, Crop Improvement Division and the FAS' Program Managers.

[redacted] Activities and Budget

The [redacted] budget for the Crop forwarding transportation is $ 1.01 million. Table 1 summarizes budgets for forwarding activities by agencies. Some risk management may be undertaken on the assumption that contingencies with and others some programs is considered as supported.

A summary of forwarding strategies for each seed planning and is presented in agencies orders shown in Appendix C. Funds are invited under the transportation support in order services of activities, including projects, new establishments, maintenance, and measurements, other analysis and attention of projects every the forwarding and is ensure expenditures, support research, and the development and maintenance of forwarding networks and investments.

Table 1 Forwarding transportation budget for [redacted] by agencies and by supply / interest

Agencies	Budget ($ '000)	Agencies	Budget ($ '000)
Private		Agencies	
[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]		
Total / cost	[redacted]		[redacted]
Total / budget / supply and / interest			[redacted]

[redacted]

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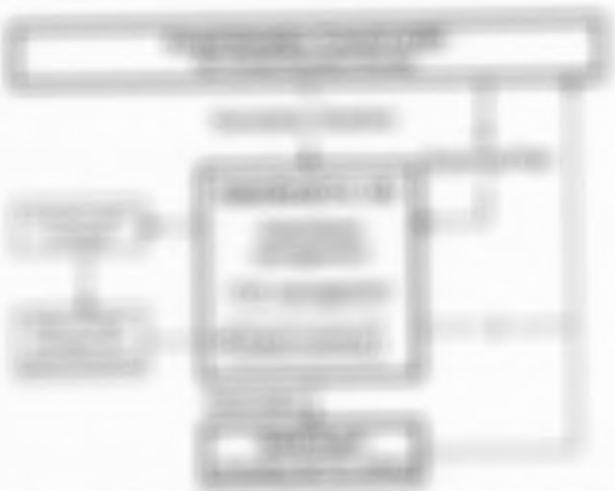

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[redacted] seed orchard management activities to maximize seed crop production will continue in the 18 original orchards. Seed production for 2010 is forecast at 83 kilograms of lodgepole pine, 72 kilograms of Douglas-fir, and 22 kilograms of spruce. Expected gross revenue from seed sales are forecast at $180,000.

Other activities will include program management on behalf of the Forest Genetics Council, including Business Plan and budget development, committee support, managing program development and subprogram interactions, and preparation of mid-term and annual reports. In addition, SelectSeed will make a contribution of $100,000 to the MFLNRO to hire a new tree breeder for interior species. This is the first year of a three year commitment to support this position within the MFLNRO.

Forecast spending for 2010/11 is $870,000 (table 4), including $240,000 for FGC management and support activities. Seed production forecasts are based on long-term production estimates for similar orchards, but annual production can vary widely.

Table 4 SelectSeed Company Ltd. 2010/11 forecast income and expenses by category

[redacted]	Total	Q1	Q2	Q3	Q4
[redacted]					
[redacted]	$[redacted]	$[redacted]	$[redacted]	$[redacted]	$[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	$[redacted]	$[redacted]	$[redacted]	$[redacted]	$[redacted]
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3.5 Extension and Communication

The Extension and Communication Subprogram supports FGC goals and objectives through:

- extension (providing client-focused solutions and training to seed users and tree improvement specialists),
- communication (developing and disseminating information on the program and its activities to all FGC target audiences),
- training.

At the current time, the Extension program is under review by the FGC. This review is organizational in nature and there is no expectation that extension work will be reduced or placed at a lower priority. For the 2015/16 fiscal year, no specific budget was allocated to extension work. However, extension projects normally carried out by through other subprogram areas will continue.

3.6 Decision Support Subprogram

The Decision Support Subprogram supports FGC goals and objectives through the development of genetic information management systems. These systems assist clients in decision making, seed policy and planning, seed use, timber supply analysis, effectiveness evaluation, monitoring, and other GRM activities.

3.6.1 Planning

Decision Support projects are developed and guided by a Technical Advisory Committee (TAC) comprised of ministry, industry and academic representatives.

3.6.2 Management

The Decision Support TAC identifies short- and long-term goals that support the GRM information needs of clients. Significant project changes or re-allocations of funds from the approved Business Plan require approval of the TAC and the FGC Program Manager on behalf of the FGC.

3.6.3 Activities and Budget

Priorities for the 2015/16 fiscal year are to continue to develop decision support systems and data to support the evolution of climate-based seed transfer science and policy. Geographic Information Systems (GIS) support is provided to Tree Improvement Branch for various projects that support FGC goals and objectives. In addition, the Climate-Based Seed Transfer project will continue to receive support for management and facilitation. A total of $60,000 is allocated to these projects (Table 5).

Table 5 Decision Support projects and budget for 2015/16

Project	Budget ($)
Geographic information system support for climate-based seed transfer development	45,000
Climate-Based Seed Transfer project management and facilitation	15,000
Total	$60,000

3.7 Cone and Seed Pest Management Subprogram

The Pest Management subprogram supports FGC objectives by reducing orchard seed losses to insect and disease pests through technical support, research, and the development of integrated pest management strategies in conjunction with orchard managers and pest management research and extension specialists.

3.7.1 Planning

The subprogram is guided by a Pest Management Technical Advisory Committee (PMTAC), with membership from industry, the MFLNRO, the Canadian Forest Service, and universities. Issues are identified and ranked by the PMTAC based on perceived impact on seed losses, and the effect of these seed losses on FGC objectives. The TAC also makes recommendations to Council regarding subprogram organization, management, and budgets.

3.7.2 Management

With direction from the PMTAC, research proposals and pest management support activities were developed by the MFLNRO cone and seed pest management specialists. These were subsequently reviewed by Pest Management TAC members, and recommendations made for project modifications. The PMTAC recommended projects and budgets to the FGC.

The MFLNRO Tree Improvement Branch manages budgets and the financial administration of projects recommended by the PMTAC and approved by the FGC. Significant priorities and changes during the fiscal year are made in consultation with the PMTAC and the FGC Program Manager.

3.7.3 Activities and budget

The total Pest Management subprogram budget for 2015/16 is $71,072. In-kind, staff time and other contributions by affiliated companies and agencies are incremental to this amount. Projects and budgets are summarized in Table 6.

Table 6 Cone and Seed Pest Management Subprogram projects for 2015/16

Project	Species impacted	Budget ($)	Products
Adult host selection preference of spruce budworm for Douglas-fir – MFLNRO Tree Imp. Branch	Fdc, Fdi	1,890	Project report
Matador and Delegate Area-Wide Trials – 2014 – SelectSeed Ltd.	Pli	20,564	Final report
Cone and Seed Pest Management – Operations Budget for the Ministry Cone and Seed Pest Biologist	All species	24,300	Reports; ongoing operations support; extension bulletins
Determine if combining Matador applications and Harvest Timing Profile crop collection strategies will result in increased seed yields in an Interior Pli orchard – MFLNRO Tree Imp. Branch	Pli	6,216	Project report
Cone and Seed Pest Research Lab – MFLNRO Tree Imp. Branch	All species	5,250	Reports; ongoing operations support
Area-wide trials of Delegate against Dioryctia in Spruce – MFLNRO Tree Imp. Branch	Sx, Se	12,852	Progress report
Total budget		$ 71,072	

3.8 Genecology and Seed Transfer Subprogram

The purpose of the Genecology and Seed Transfer Subprogram is to effectively direct funding to priority genecology and seed transfer projects in support of FGC strategic objectives and provincial seed transfer policy development.

3.8.1 Planning

The subprogram is guided by the Seed Transfer TAC (STTAC), with representation from MFLNRO, industry, and university stakeholders. Priorities for genecology and seed transfer information needs are set within the context of other work currently underway, such as in the Breeding Subprogram, existing genecology trials, and seed transfer policy needs. The STTAC reviews priorities and projects set out by MFLNRO Tree Improvement Branch (TIB) scientists, leads the development of a call for proposals for non-MFLNRO projects, and makes recommendations to the FGC regarding budgets, priorities, and delivery process.

3.8.2 Management

The STTAC developed a list of priorities for genecology and seed transfer projects by species and type of work. Based on these priorities, a strategy was compiled by TIB scientists and reviewed by a review committee on behalf of the STTAC. In addition, a call for proposals was released by the TIB on behalf of the STTAC and proposals were screened by a review committee of the STTAC. Funding recommendations were made to the FGC

The MFLNRO Tree Improvement Branch manages financial administration for approved projects through either direct spending within the Branch or through contracts with successful project proponents. Project financial and progress reporting is managed through the TIB, and incorporated in annual FGC reports.

3.8.3 Activities and budget

The total budget allocated to the Genecology and Seed Transfer Subprogram for 2015/16 is $361,052. This amount falls into two primary categories:

1. Successful proposals from a proposal call open only to proponents outside the MFLNRO - $73,827 (Table 7).
2. Projects led by scientists from the MFLNRO TIB, including the Assisted Migration Adaptation Trial - $287,225 (Table 8). This budget may be extended through risk management, at the discretion of the Tree Improvement Branch.

Table 7 Genecology and Seed Transfer Subprogram projects led by non-MFLNRO proponents and approved through a call for proposals.

Species	Project title	Budget ($)	Performance indicator
Sx, Pli	Assessing the adaptive portfolio or reforestation stocks for future climates. The project is leveraged with funding through the Genome Canada funded AdaptTree genomics project (UBC - Aitken).	$ 53,750	Project report; scientific publications
Cw	Identifying cedar blight resistance to develop durable and resistant western redcedar populations for future climates (UVic - Hawkins)	$ 20,077	Progress report
Total budget		**$ 73,827**	

Table 8 MFLNRO Tree Improvement Branch Genecology and Seed Transfer Subprogram project funding and priority activities by species for 2015/16.

Species	Approved budget ($ x 1000)	Priority activities
Lodgepole pine	0	
Interior Douglas-fir	39	Field trial maintenance and measurement
Western redcedar (coast)	8	Field trial maintenance
Coastal Douglas-fir	24	Field trial establishment and maintenance
Interior spruce	43	Field trial maintenance and measurement
Westerh hemlock	21	Field trial measurement
Sub-alpine fir	14	Field trial maintenance and measurement
Western larch	11	Field trial maintenance and measurement
Western redcedar (interior)	13	Field trial maintenance and measurement
Pacific silver fir	11	Field trial maintenance
Western white pine	0	
Yellow cypress	11	Field trial maintenance and measurement
Sitla spruce	11	Field trial measurement and data analysis
Red alder	4	Field trial maintenance
Birch	0	
Grand fir	1	Field trial maintenance
Poplar	10	Field trial maintenance and measurement
Ponderosa pine	0	
Big-leaf maple	7	Field trial maintenance and measurement
Noble fir	1	Field trial maintenance
Assisted migration adaptation trial	60	Field trial maintenance and measurement
Totals	**287.2**	

* Assisted Migration Adaptation Trial; includes multiple species.

3.9 Applied Tree Improvement and Biotechnology

The Applied Tree Improvement and Biotechnology research program accepts proposals that support the objectives of the Forest Genetics Council of BC in the area of new technologies and their application to GRM in BC.

3.9.1 Planning

Project proposals received under this funding category are developed by proponents based on their knowledge of needs and opportunities within the broad provincial GRM program or on suggestions received from others active within the program. The intent is to provide a funding mechanism in support of projects that have the potential to contribute to FGC objectives but do not fit the more specific funding requirements of other FGC subprograms.

3.9.2 Management

Project proposals were received by the FGC Program Manager and reviewed by a Steering Committee reporting to the FGC. Criteria for project evaluation included the potential to contribute to FGC objectives, probability of success, proponent ability to meet project objectives, and cost. The Steering Committee considered project costs and reserved the right to suggest modifications to project activities or scope and to modify budgets, where they felt it was appropriate.

3.9.3 Projects and budget

Three proposals were received and reviewed under this subprogram and one proposal was approved for 2015/16 with reduced funding of $125,550. The approved project is a continuation of a projected funded in 2014/15. Part one of this project investigates the possibility that lodgepole pine filled seed losses in north Okanagan seed orchards is being at least partially caused by a fungus. Part two of the proposal will continue an ongoing project that is assessing hormonal treatment options for Douglas-fir and lodgepole pine to increase cone production. This project is being led through the University of Victoria.

1.10 Administration

Administration of the LBIS Tree Improvement Program is provided by the Tree Improvement Branch of the MFLNRO. There are three components to this work:

- the administration of LBIS funds allocated to subprograms managed by the MFLNRO, including Tree Breeding, OTIP, Genecology and Seed Transfer, Extension and Communication, Pest Management, and Genetic Resource Information Management,
- the administration of contracts with successful proponents through the OTIP, Genecology and Seed Transfer proposal calls, and with universities and SelectSeed Company Ltd.,
- support for the business of the FGC, including scheduling meetings, assistance with information distribution, and dealing with queries and planning.

3.10.1 Costs

MFLNRO administration costs are reviewed by the FGC, and a recommendation is made for support under LBIS. The administration budget is approved by the FGC in conjunction with other LBIS Tree Improvement Program budget items.

3.10.2 Management

Overall program management is carried out on behalf of the Forest Genetics Council by the FGC Program Manager working for SelectSeed Company Ltd. This work includes planning, coordination of committees, Business Plan development, reporting, correspondence, and representing the FGC in daily business. The MFLNRO Tree Improvement Branch provides administrative support, overall financial management, and assistance with the coordination of FGC business.

3.10.3 Activities and Budget

The 2015/16 budget for the Administration Subprogram is $10,000. This amount includes all program administration costs incurred by the MFLNRO Tree Improvement Branch.

3.11 Budget Summary

A Land Base Investment Strategy Tree Improvement Program budget allocation of $2.5 million is approved for the 2015/16 fiscal year, and is summarized in Table 9. An additional approximately $242,600 will be contributed by Council-owned SelectSeed Ltd. to cover program management, meeting costs, website, publications, and other support work.

Table 9 2015/16 budget summary for LBIS Tree Improvement Program contributions to subprograms.

Subprogram	Allocation
Genetic Conservation	238,970
Tree Breeding	1,130,734
Operational Tree Improvement Program (OTIP)	502,622
SelectSeed Company Ltd.	0
Extension and Communication	0
Cone and Seed Pest Management	71,072
Genecology and Seed Transfer	361,052
Genetic Resource Decision Support	60,000
Applied Tree Improvement and Biotechnology	125,550
Administration (Tree Improvement Branch)	10,000
Total LBIS contribution	**$ 2,500,000**
SelectSeed Ltd. contribution	**$ 242,600**
Total FGC budget	**$ 2,742,600**

4.0 Funding and Administrative Mechanisms

4.1 Funding Agreements

The Land Base Investment Strategy Tree Improvement program is administered by the Tree Improvement Branch of the MFLNRO. FGC Business Plan activities are supported through the following administrative mechanisms:

- MFLNRO/SelectSeed Co. Ltd. Multi-Year Agreement
- MFLNRO contracts
- MFLNRO/University grants and transfers
- MFLNRO direct management and administration

The subprograms associated with each of the mechanisms are shown in Figure 4. Resources from other agencies include in-kind facilities, staff and direct funds. Seed sales from orchards also provide revenue to support seed production. Only Land Base Investment Program funding and SelectSeed Ltd. budgets are detailed in this Business Plan.

Figure 4 Administrative mechanisms for the delivery of the LBIS Tree Improvement Program funding

4.2 Monitoring and Reporting

Monitoring progress is an important objective of the FGC program. All LBIS funded activities report on performance relative to criteria. In addition, progress towards long-term objectives is measured at the provincial level for all FGC activities.

4.2.1 Project-Level Reporting

Projects from each subprogram provide reports to be published in the annual Tree Improvement Program Projects Report for 2015/16. Work quality will be periodically audited through Review Committees and site visits. Reports will be received and reviewed by Technical Advisory Committees or project steering committees, as appropriate, as well as by the MFLNRO Program Administrator and the FGC Program Manager. Reporting to the MFLNRO Program Administrator on spending and progress is required for all GTIP projects and other contracts with the MFLNRO.

4.2.2 Provincial-Level Reporting

Progress towards FGC provincial objectives (see section 1.1) for increasing genetic worth of seedlots used, increasing the use of orchard seed, and climate-based seed transfer will be reported using provincial summaries of performance indicators. Interfibre Company Ltd. will produce an annual report showing performance indicators, financial statements, and audit reports. Reporting requirements are identified in Table 10.

Table 10 List of reports, responsibilities, distribution, and preparation dates for LBIS-supported projects.

Type of report	Prepared by	Prepared for	Distribution	Dates due
Interim project status	Project leader	MFLNRO program administrators for early FY notifications	On request	Aug 1
Project level	Project proponent	MFLNRO Program Administrator	On request	Oct 30 April 30
Annual reports and progress summary	FGC Program Manager, Program Administrator MFLNRO, project leader contributions	FGC, MFLNRO Chief Forester, TACs, general distribution	FGC members, TACs, FIA administrators, MFLNRO, general distribution, FGC website	Aug. 30

The Interim Project Status report is an informal report intended only to identify projects that are not progressing as planned, and for which funds may be re-allocated.

Appendix 1: Seed Planning Units and Categories

The following table lists seed planning units (SPU) and activity categories. All provincial SPUs are grouped to one of four categories using a protocol developed by the FGC Strategic Planning Committee. The protocol evaluates SPUs based on the net present value of tree improvement investments, feasibility criteria, zone changes due to climate change, opportunities, and seed transfer information needs. Listed SPUs in categories 1 to 3 have a Species Plan in Appendix 3. Categorization for SPUs 4=0, 8 and 15, are based on an expectation of increased planting with pest resistant material.

Program categories include:

- 1. Advanced-generation program,
- 2. First-generation program only,
- 3. Genecology research only, and
- 4. No genetics program (SPUs in this category are not listed here).

Seed planning unit (SPU)				Program
#	Species	BEC	Elev. band (m)	category
1	Fdc	all	1-600	1
2	Cw	all	1-700	1
3	Hw	all	1-600	2
4	Sx	all	600-1700	1
5	Sx	all	1700-2100	3
6	Sx	all	1-600	2
7	Pl	all	700-1600	1
8	Fd	IDFdm	1-1000	1
9	Dr	all	1-1000	3
10	Pl	1	700-1400	1
11	Ss	all	1-1100	3
12	Pl	2	700-1400	1
13	Lw	all	700-1600	1
14	Sx	2	600-1400	1
15	Fd	2	600-1400	1
16	Pl	1	1400-1600	3
17	Pl	2U	700-1400	1
18	Pl	2P	700-1300	1
19	Fdc	all	200-1000	3
20	Pl	all	1600-2000	3
21	Fd	all	600-1300	1
22	Fd	all	1300-1600	3
23	Ss/Sx	SWB/ICH	all	3
24	Hw	all	400-1100	3
25	Sx	2W	700-1600	3
26	Pl	2	1400-2000	3
27	Cw	2W	200-1000	3

Seed planning unit (SPU)				Program
#	Species	BEC	Elev. Band (m)	category
28	Ss	1	1300-1700	3
29	Pl	1W	1600-2000	3
30	Ss	1	700-1600	1
31	Fdc	all	600-1300	3
32	Pl	1W	600-1400	3
33	Cw	all	700-1600	3
34	Lw	1W	600-1700	1
35	Ss	1W	600-1400	3
36	Ba	all	1-700	3
37	Fdc	2L	700-1400	3
38	Hw	all south	1400 (and 1700) m	3
39	Fdc	1W	700-1400	3
40L	Sx	PR low	400-800	3
40H	Sx	PR high	800-1200	3
41	Fdc	2L	700-1300	3
42	Ss	2L	1300-1700	3
43	Fdc	1T	600-1400	3
44	Ss	all	1-1000	1
45	Pl	SWB/ICH	all	3
46	all	all ex	all	3
47	Ss	all	all	3
48	Broadleaves	Interior	-	3
49	Broadleaves	Coast	-	3
50	Lw	all	1400-1600	3
51	Pl	1, interior	600-1000	3
52	Fdc	1L	600-1100	3
53	Fdc	1U	1100-1600	3
54	Water	all	1-700	3

Seed zones are adjusted from time to time based on new research information, or on administrative needs. For information updates on seed zones, please contact Lee Charleson of the Ministry of Forests and Range Tree Improvement Branch (lee.charleson@gov.bc.ca).

Appendix D: Forest Genetics Council and Technical Advisory Committee Members

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Name	Affiliation	Representing
[redacted]	[redacted]	[redacted]
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[redacted] Transportation Technical Advisory Committee

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Risk Management Technical Advisory Committee

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[redacted] Project Advisory Committee

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Asset Capacity Technical Advisory Committee

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